UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,623	07/03/2003	Gregory J. McRac	037010-0105	4384

30542 7590 11/27/2006

FOLEY & LARDNER LLP
P.O. BOX 80278
SAN DIEGO, CA 92138-0278

EXAMINER	
CRAIG, DWIN M	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,623	MCRAE ET AL.	
	Examiner	Art Unit	
	Dwin M. Craig	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/3/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-45 have been presented for examination.

Specification

2. The attempt to incorporate subject matter into this application by reference to "METHOD AND SYSTEM FOR INTEGRATED UNDERTAINTY ANALYSIS" on page 9 of the specification is ineffective because the application serial number is missing, specifically, non-provisional application number 10/613,706.

Correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Applicants' claim language is directed towards *a system*, however the claimed system is a series of software modules and is therefore disclosing non-functional descriptive material and therefore fails to fall into a statutory category of patentable subject matter further, the claimed subject matter fails to disclose or suggest a *useful, concrete and tangible result* as required.

See section 2107 of the August 2006 revision of the MPEP.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 13, 24, 35 and 4, 16, 27, 38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,549,854 Malinverno in view of "OPEN SOURCE SIMULATION MODELING LANGUAGE (SML)" by Richard A. Kilgore hereafter referred to as *Kilgore*.

4.1 As regards independent claims 1, 13, 24, 35 and using independent claim 1 as an example, *Malinverno* teaches, *a method of analyzing uncertainties in a system having at least two modules,* (Figure 1 reference 10 "CREATE MODEL AND INITIAL UNCERTAINTY ESTIMATE" and reference 16 and reference 24 and the descriptive text and more specifically Col. 4 lines 33-40) *comprising: propagating an uncertainty distribution associated with each of a set of inputs through a module to produce an uncertainty in a set of outputs of said module;* (Figure 1 reference 24 "UPDATE MODEL AND UNCERTAINTY ESTIMATE" and the descriptive text and more specifically Col. 5 lines 16-56) *generating a probabilistically equivalent model of said module, said equivalent model producing a model of said outputs;* (Figure 5 and Col. 6 lines 53-67 and Col. 7 lines 1-30 the quantification of uncertainty using a Monte Carlo method is functionally equivalent to *generating a probabilistically equivalent model*),

However, *Malinverno* does not expressly disclose, *and providing said model of said outputs in a common data architecture for use as inputs by any other module in said system.*

Kilgore teaches *and providing said model of said outputs in a common data architecture for use as inputs by any other module in said system* (Abstract page 607).

Malinverno and *Kilgore* are analogous art because they are from the similar problem solving area of performing mathematical analysis and simulation using a computer.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the software simulation methods of *Kilgore* with the uncertainty analysis methods of *Malinverno*.

The suggestion for doing so would have been to improve the quality of common core simulation functions, improve the potential for creating reusable modeling components from those core functions, and improve the ability to merge those components using XML, HLA and other simulation community standards. *See Abstract page 607 of Kilgore.*

Therefore, it would have been obvious to combined *Kilgore* with *Malinverno* to obtain the invention specified in claims 1, 13, 24, 35 and 4, 16, 27, 38.

4.2 As regards dependent claims 4, 16, 27 and 38 *Malinverno* discloses *wherein said propagating said uncertainty distribution uses a Monte Carlo method* (Col. 2 lines 36-49).

5. Claims 2, 14, 25, 36 and 3, 15, 26, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Malinverno* as modified by *Kilgore* as applied to claims 1, 13, 24, 35 and 4, 16, 27, 38 above, and further in view of *Sepulveda et al.* US Patent 6,173,240.

Malvinverno as modified by *Kilgore* teaches a system of uncertainty analysis that outputs to a common data architecture for the reasons above, differing from the invention as recited in claims 2 & 3 in that their combined teaching lacks

(claims 2, 14, 25 and 36) wherein said probabilistically equivalent model is a deterministically equivalent model,

(claims 3, 15, 26 and 37) wherein said deterministically equivalent model is a reduced-order model.

Sepulveda et al. teaches (claims 2, 14, 25 and 36) wherein said probabilistically equivalent model is a deterministically equivalent model, (Col. 5 lines 25-45),

(claims 3, 15, 26 and 37) wherein said deterministically equivalent model is a reduced-order model (Col. 8 lines 20-25).

Malvinverno as modified by *Kilgore* and *Sepulveda et al.* are analogous art because they are all related to simulation and modeling.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the uncertainty modeling methods of *Sepulveda et al.* in the uncertainty modeling methods of *Malvinverno* as modified by *Kilgore* because *Sepulveda et al.* teaches there is a need in the art to perform *Monte Carlo* sampling in less time (see *Sepulveda et al.* Col. 2 lines 61-64).

6. Claims 6, 17, 28, 39 and 7, 18, 29, 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,549,854 *Malinverno* in view of "OPEN SOURCE SIMULATION MODELING LANGUAGE (SML)" by Richard A. Kilgore hereafter referred to as *Kilgore*.

6.1 As regards independent claims 6, 17, 28 and 39 and using independent claim 6 as an example, *Malinverno* teaches, *a method of analyzing uncertainties in a system, comprising: substituting at least one of a plurality modules of a system with a corresponding probabilistically equivalent module model, said equivalent module model adapted to propagate uncertainties in inputs of said module to outputs of said module;* (Figure 1 reference 10 "CREATE MODEL AND INITIAL UNCERTAINTY ESTIMATE" and reference 16 and reference 24 and the descriptive text and more specifically Col. 4 lines 33-40 and Figure 5 and Col. 6 lines 53-67 and Col. 7 lines 1-30), *providing outputs of each of said modules and substituting said plurality of modules with a single probabilistically equivalent system model for propagating uncertainties in*

system inputs to system outputs (Figure 1 reference 24 "UPDATE MODEL AND UNCERTAINTY ESTIMATE" and the descriptive text and more specifically Col. 5 lines 16-56).

However, *Malinverno* does not expressly disclose, *a common data architecture.*

Kilgore teaches *a common data architecture* (Abstract page 607).

Malinverno and *Kilgore* are analogous art because they are from the similar problem solving area of performing mathematical analysis and simulation using a computer.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the software simulation methods of *Kilgore* with the uncertainty analysis methods of *Malinverno.*

The suggestion for doing so would have been to improve the quality of common core simulation functions, improve the potential for creating reusable modeling components from those core functions, and improve the ability to merge those components using XML, HLA and other simulation community standards. *See Abstract page 607 of Kilgore.*

Therefore, it would have been obvious to combined *Kilgore* with *Malinverno* to obtain the invention specified in claims 6, 17, 28, 39 and 7, 18, 29, 40.

6.2 As regards dependent claims 7, 18, 29 and 40 *Malinverno* teaches *providing an optimization module for optimizing an objective function, said optimization module adapted to receive said system outputs and to vary said system inputs* (Col. 8 lines 10-21).

7. Claims 8-12, 19-23, 30-34 and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Malinverno* as modified by *Kilgore* as applied to claims 6, 17, 28, 39 and 7, 18, 29, 40 above, and further in view of *Sepulveda et al.* US Patent 6,173,240.

Malvinverno as modified by *Kilgore* teaches a system of uncertainty analysis that outputs to a common data architecture for the reasons above, differing from the invention as recited in claims 8-12, 19-23, 30-34 and 41-45 in that their combined teaching lacks

(claims 8, 19, 30, 41) wherein said objective function is a weighted function of two or more output parameters.

(claims 9, 20, 31, 42) wherein said probabilistically equivalent model is a deterministically equivalent model.

(claims 10, 21, 32, 43) wherein said deterministically equivalent model is a reduced-order model.

(claims 11, 22, 33, 44) wherein said probabilistically equivalent system model is a deterministically equivalent model.

(claims 12, 23, 34, 45) wherein said deterministically equivalent model is a reduced-order model.

Sepulveda et al. teaches (claims 8, 19, 30, 41) said objective function is a weighted function (Col. 3 lines 19-32),

(claims 9, 20, 31, 42 and 11, 22, 33, 44) wherein said probabilistically equivalent model is a deterministically equivalent model, (Col. 5 lines 25-45),

(claim 10, 21, 32, 43 and 12, 23, 34, 45) wherein said deterministically equivalent model is a reduced-order model (Col. 8 lines 20-25).

Malvinverno as modified by *Kilgore* and *Sepulveda et al.* are analogous art because they are all related to simulation and modeling.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the uncertainty modeling methods of *Sepulveda et al.* in the uncertainty modeling methods of *Malvinverno* as modified by *Kilgore* because *Sepulveda et al.* teaches there is a need in the art to perform *Monte Carlo* sampling in less time (see *Sepulveda et al.* Col. 2 lines 61-64).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dwin McTaggart Craig

11/22/06

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100